New Zealand Agricultural & Resource Economics Society (Inc.)
NZARES

Allocation and cost sharing in agricultural greenhouse gas markets

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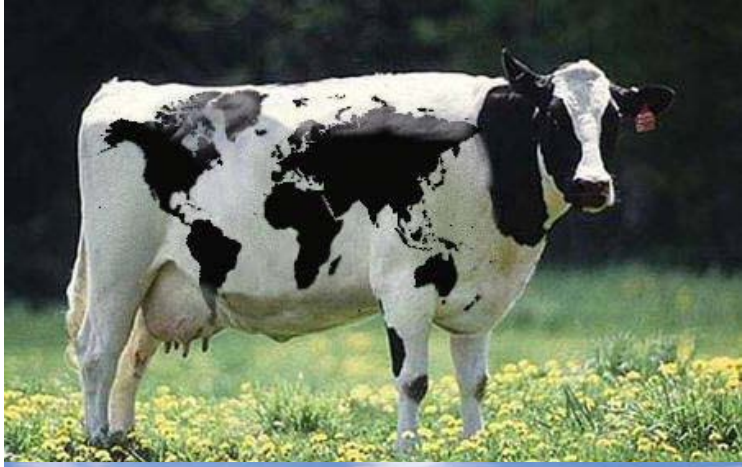
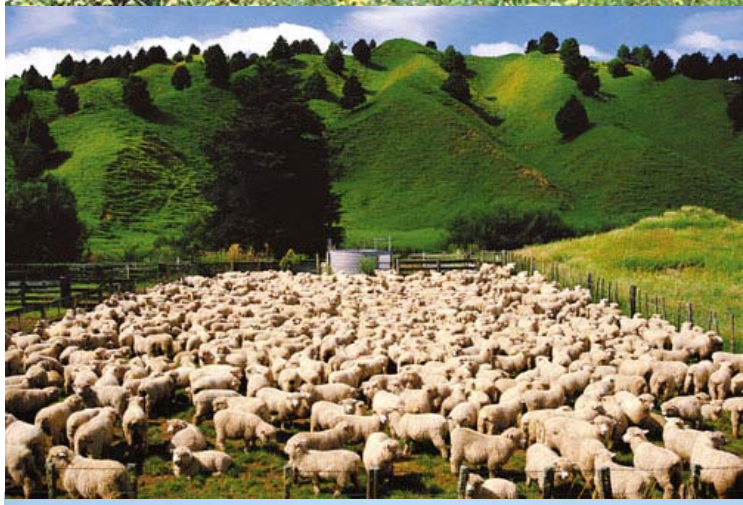
Allocation and cost sharing in agricultural greenhouse gas markets

A synthesis of Motu work

Suzi Kerr, Motu
(and Levi Timar, GNS)

NZARE, Lincoln
August, 2013





What do we know about GHG cost incidence and how to address it with free allocation?

Pathways for incidence

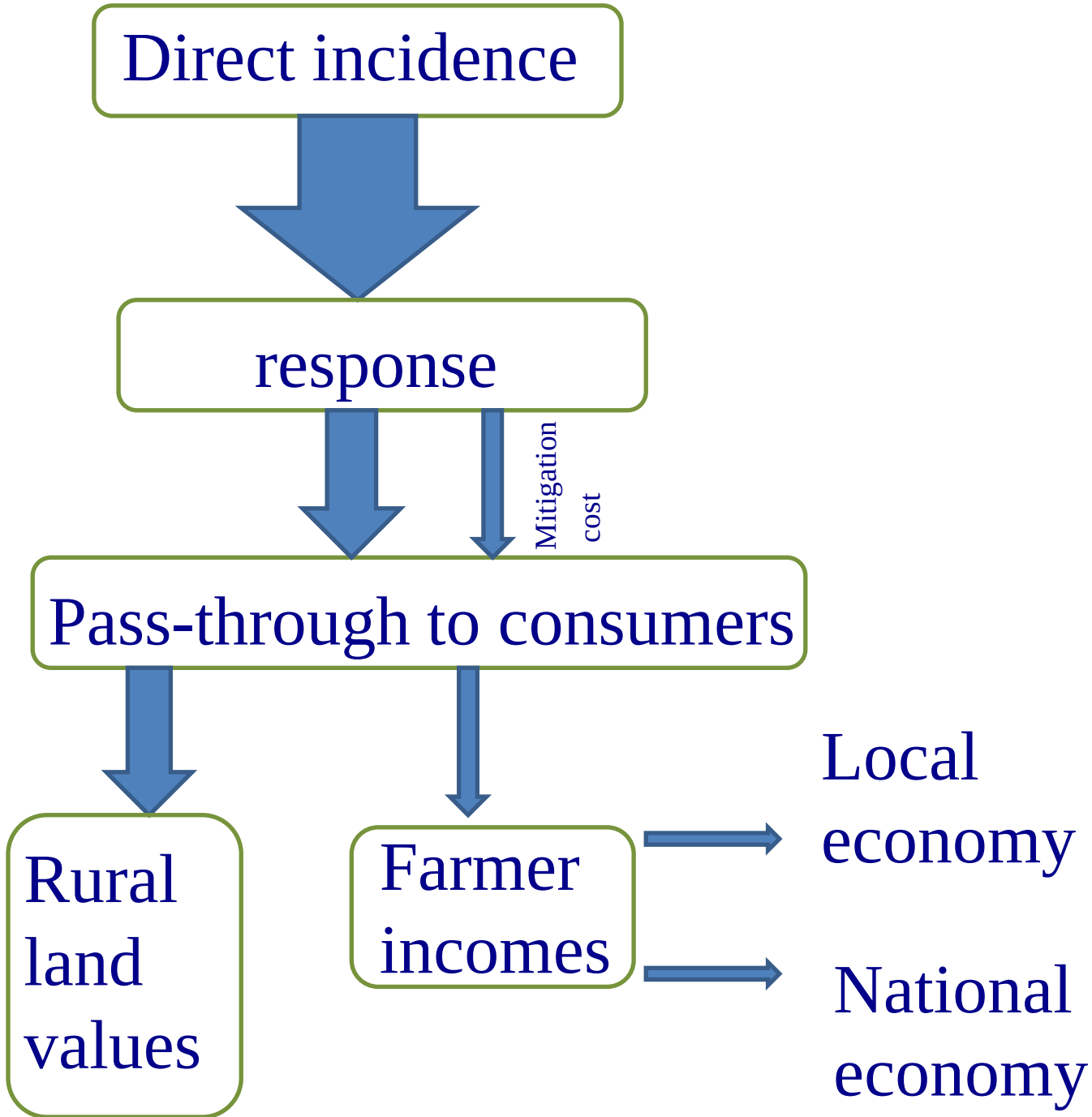
Evidence on incidence

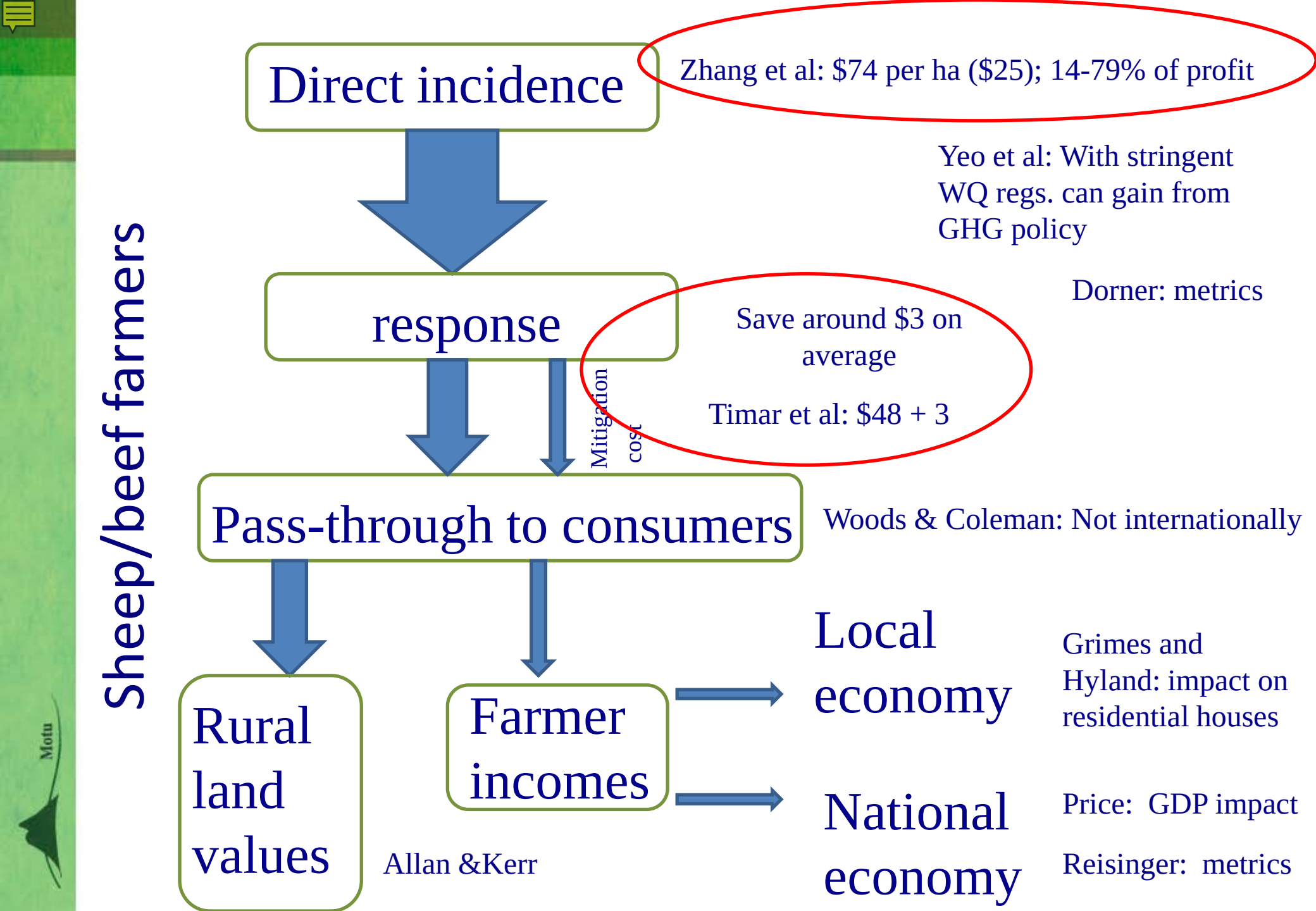
So what?

Illustrative case study of free allocation (two mechanisms) using LURNZ

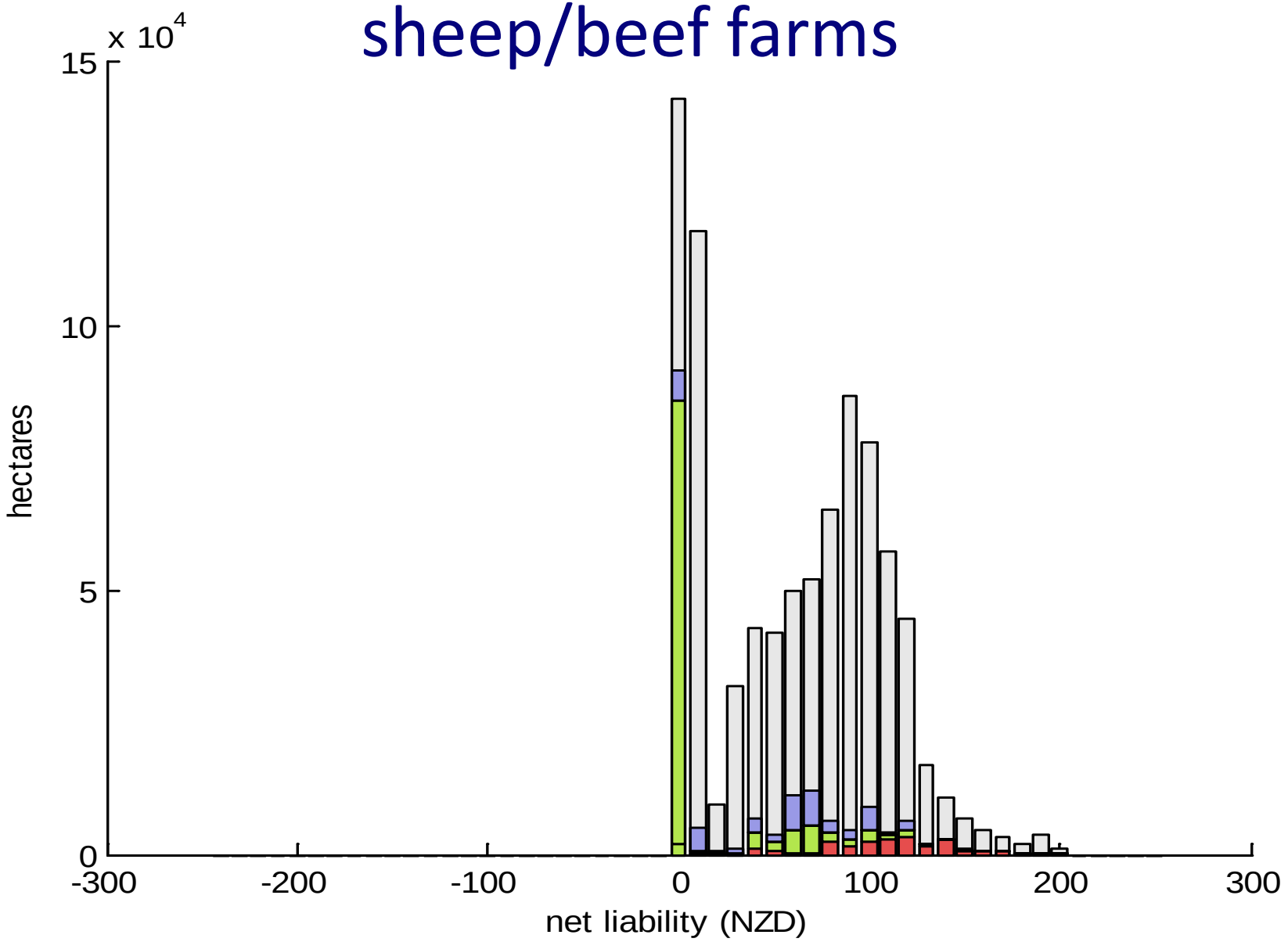
Effects of sheep/beef farm heterogeneity

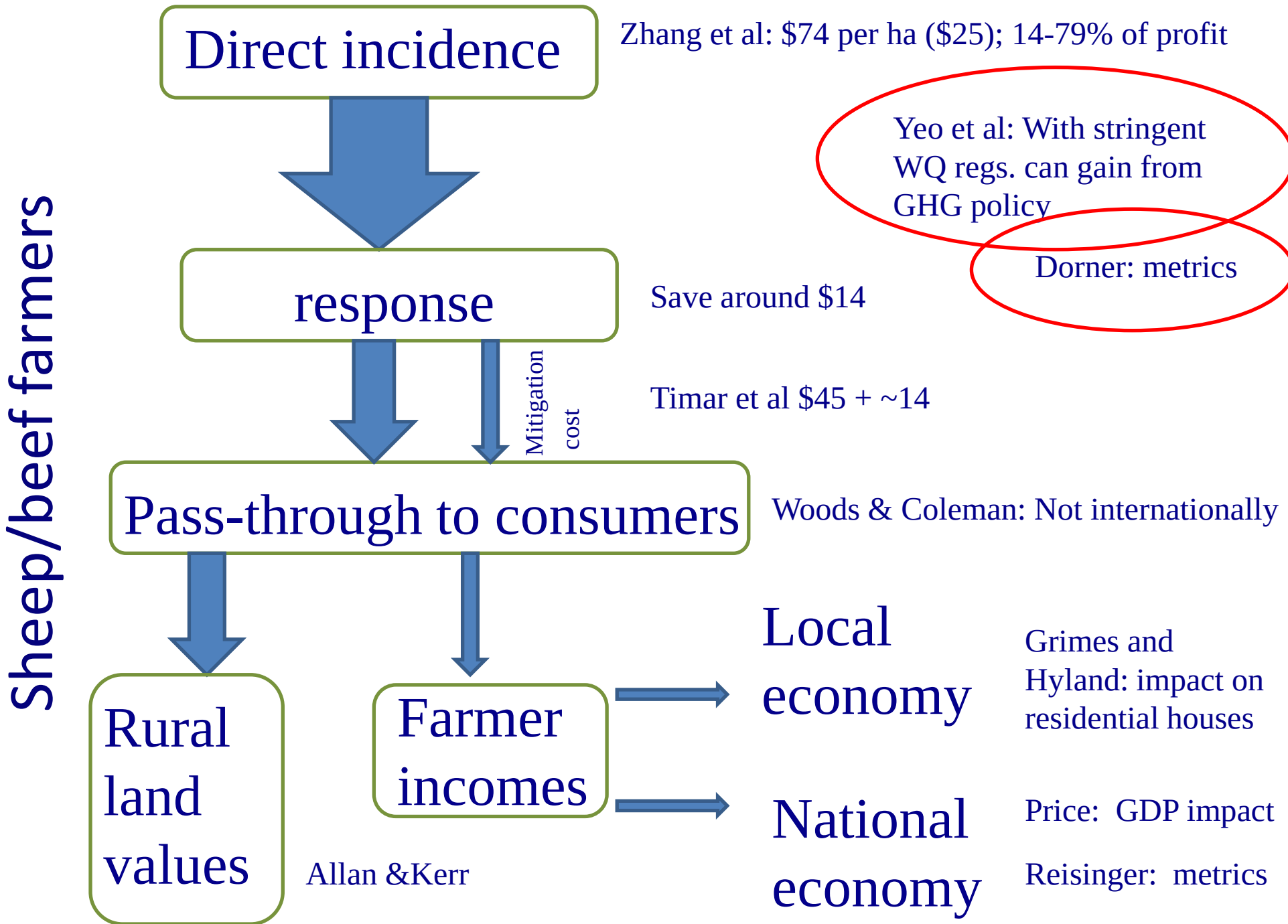
Pathways for incidence




Sheep/beef farmers
Direct incidence
Zhang et al: $74 per ha ($25); 14-79% of profit
Yeo et al: With stringent WQ regs. can gain from GHG policy
response
Dorner: metrics
Save around $3 on average
Timar et al: $48 + 3
Mitigation cost
Pass-through to consumers
Woods & Coleman: Not internationally
Rural land values
Farmer incomes
Local economy
Grimes and Hyland: impact on residential houses
National economy
Price: GDP impact
Reisinger: metrics
Allan &Kerr

Wide range of impacts per ha on sheep/beef farms

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Zhang et al: $74 per ha ($25); 14-79% of profit
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Save around $14
Mitigation cost
Timar et al $45 + ~14
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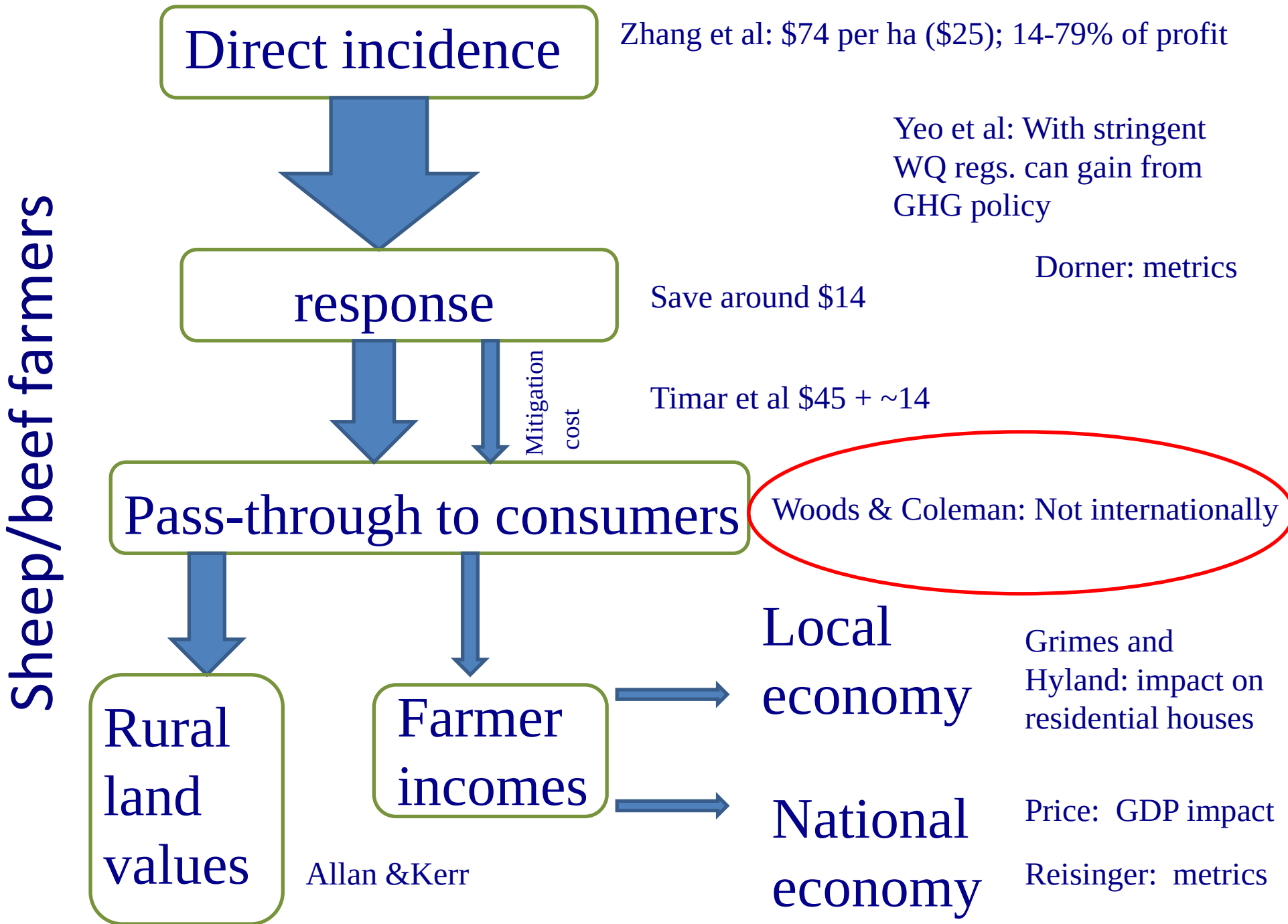
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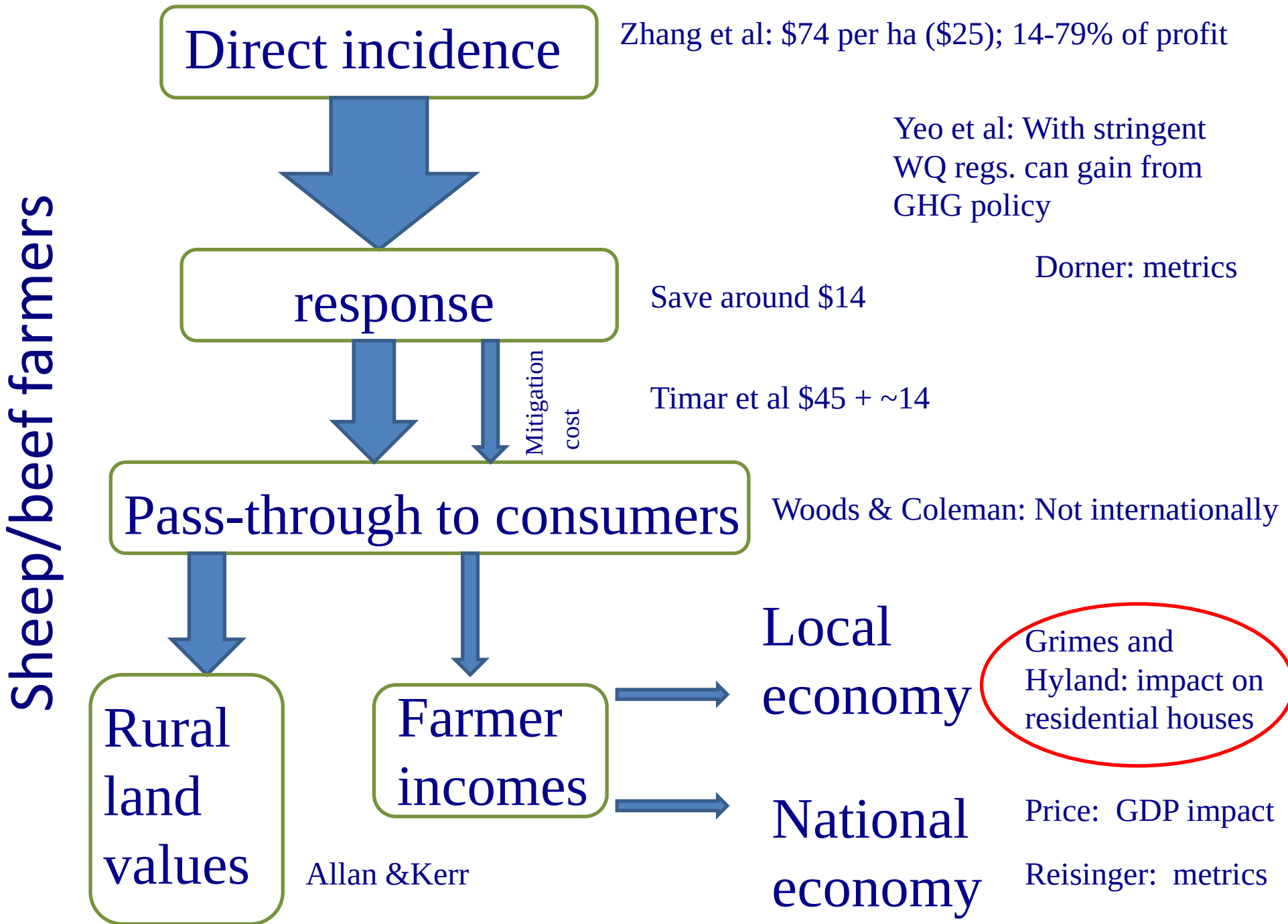
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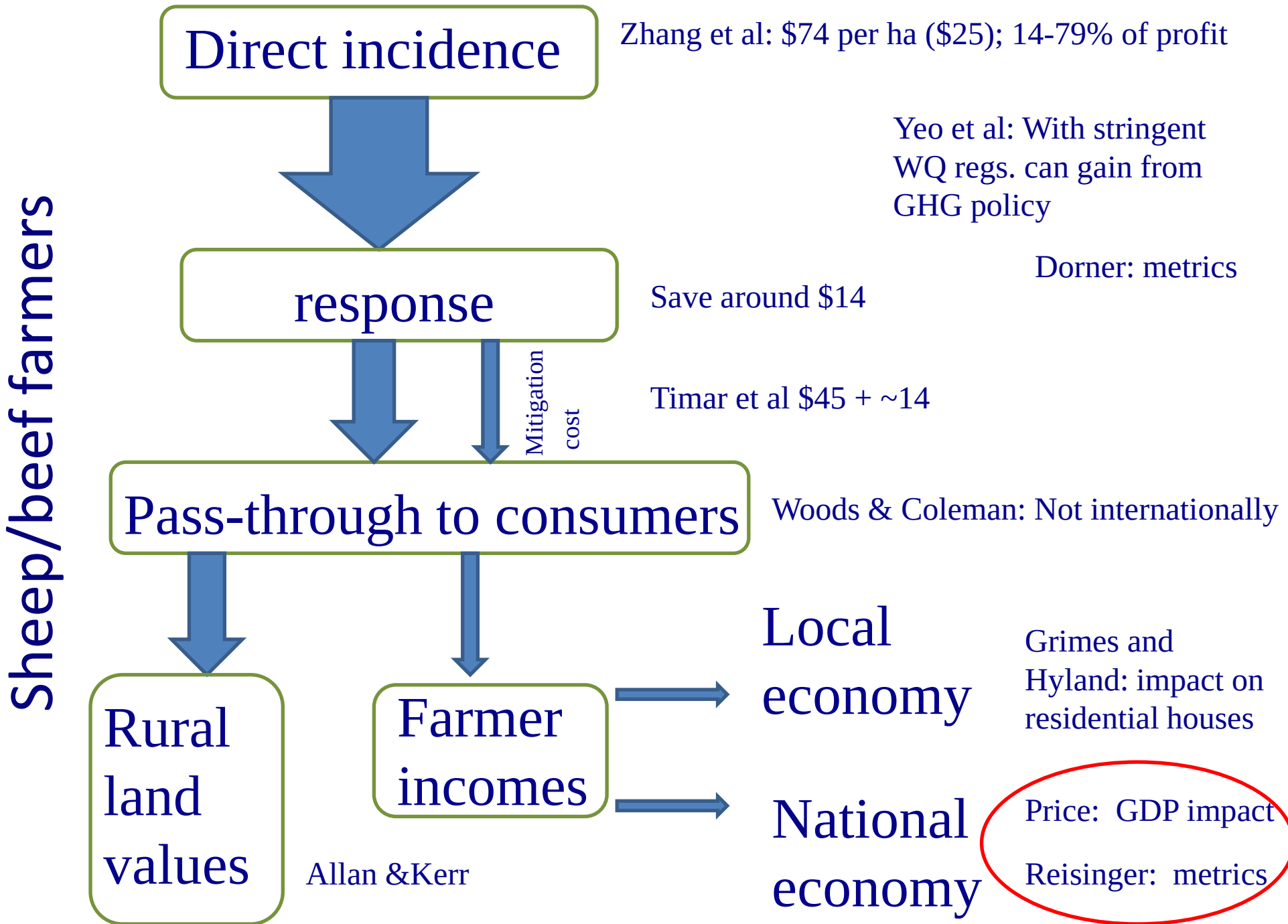
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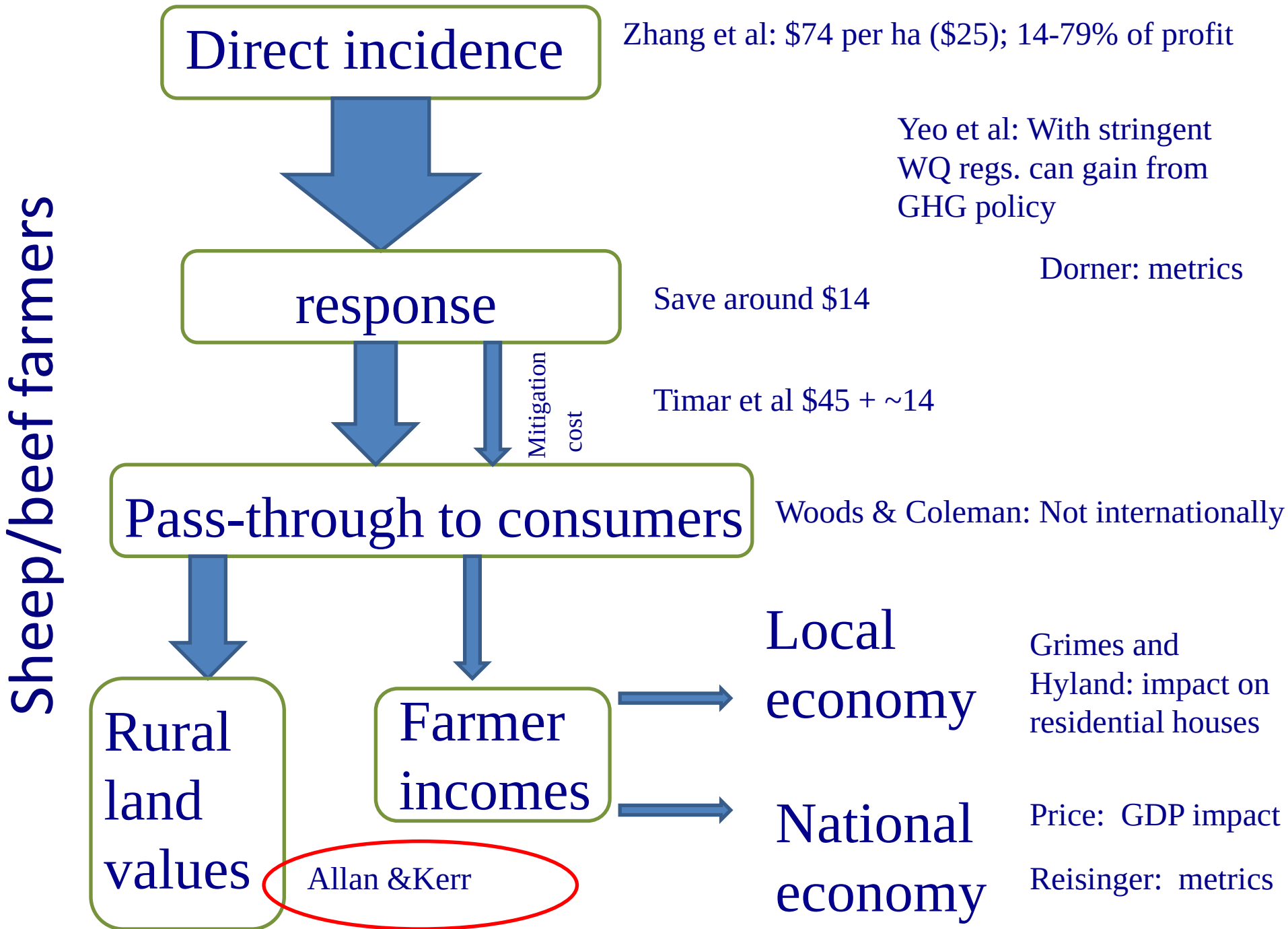
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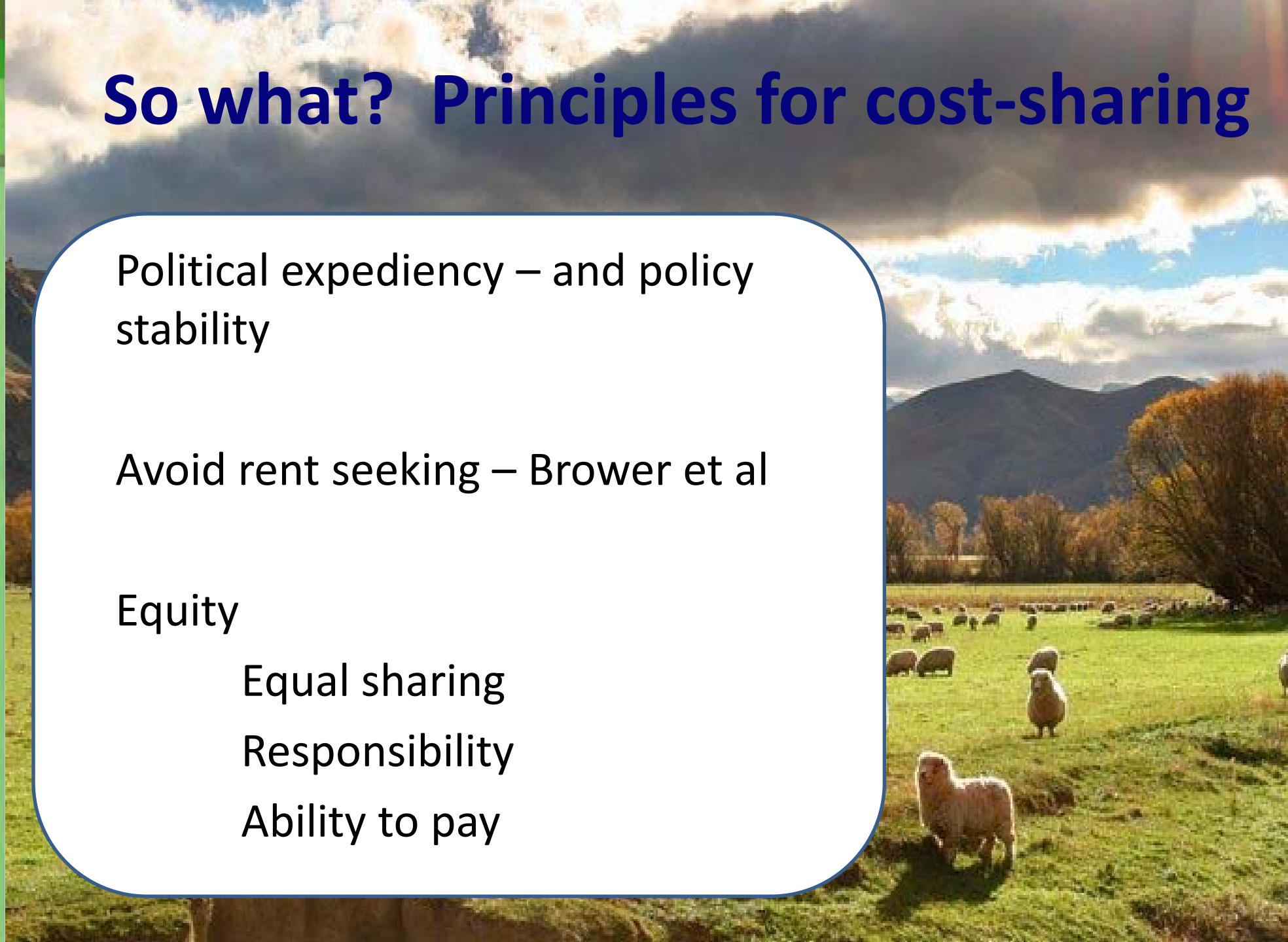
So what? Principles for cost-sharing

Political expediency – and policy stability

Avoid rent seeking – Brower et al

Equity

- Equal sharing
- Responsibility
- Ability to pay



How we can alter cost sharing

Free allocation to owners of land

Retraining assistance for rural workers

Direct support for local communities

Marketing as ‘clean green’

Pressure to impose similar costs internationally

Allocation scenarios

1) Grandparenting

past emissions

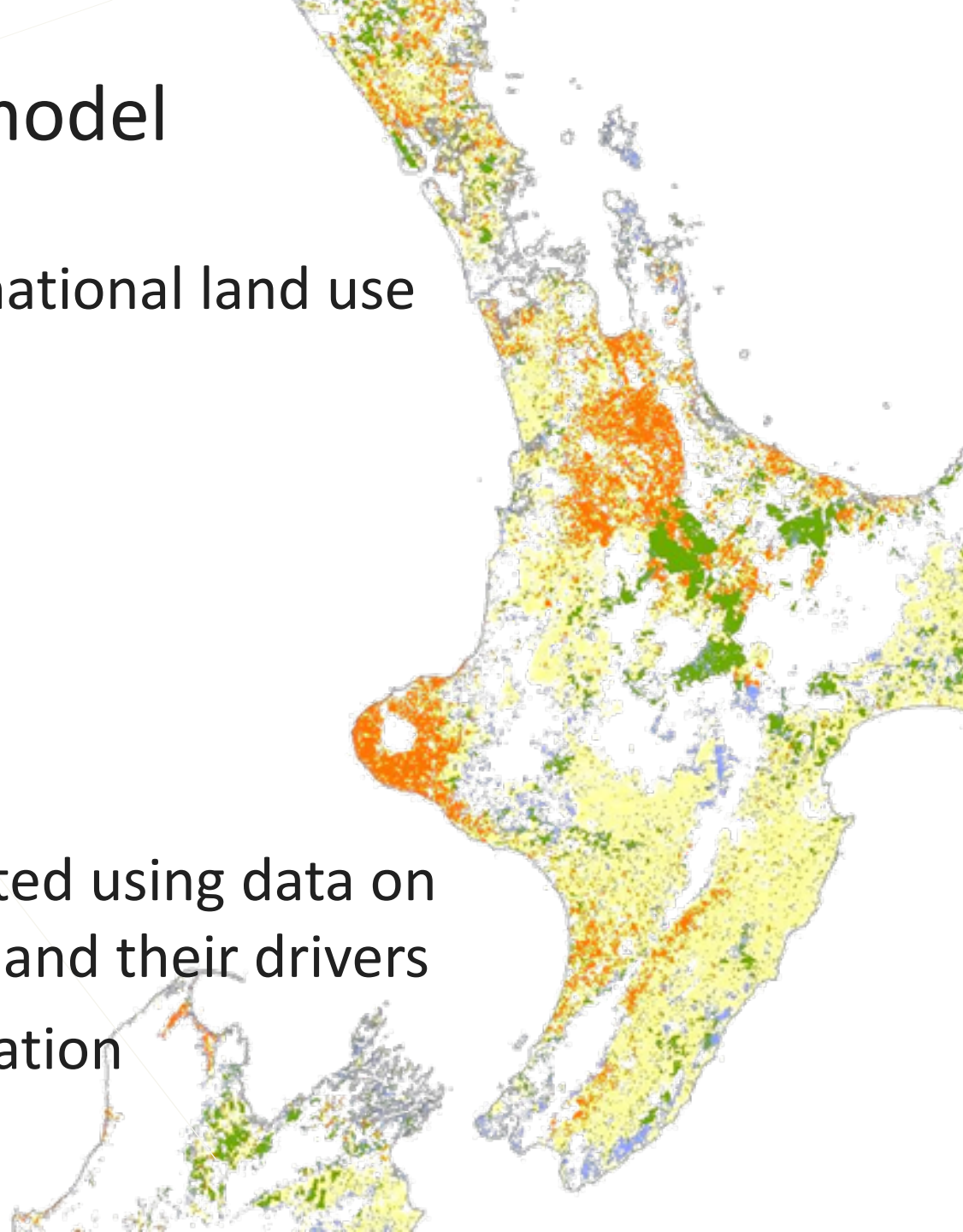
2) Natural capital-based

potential emissions
(based on LUC class)

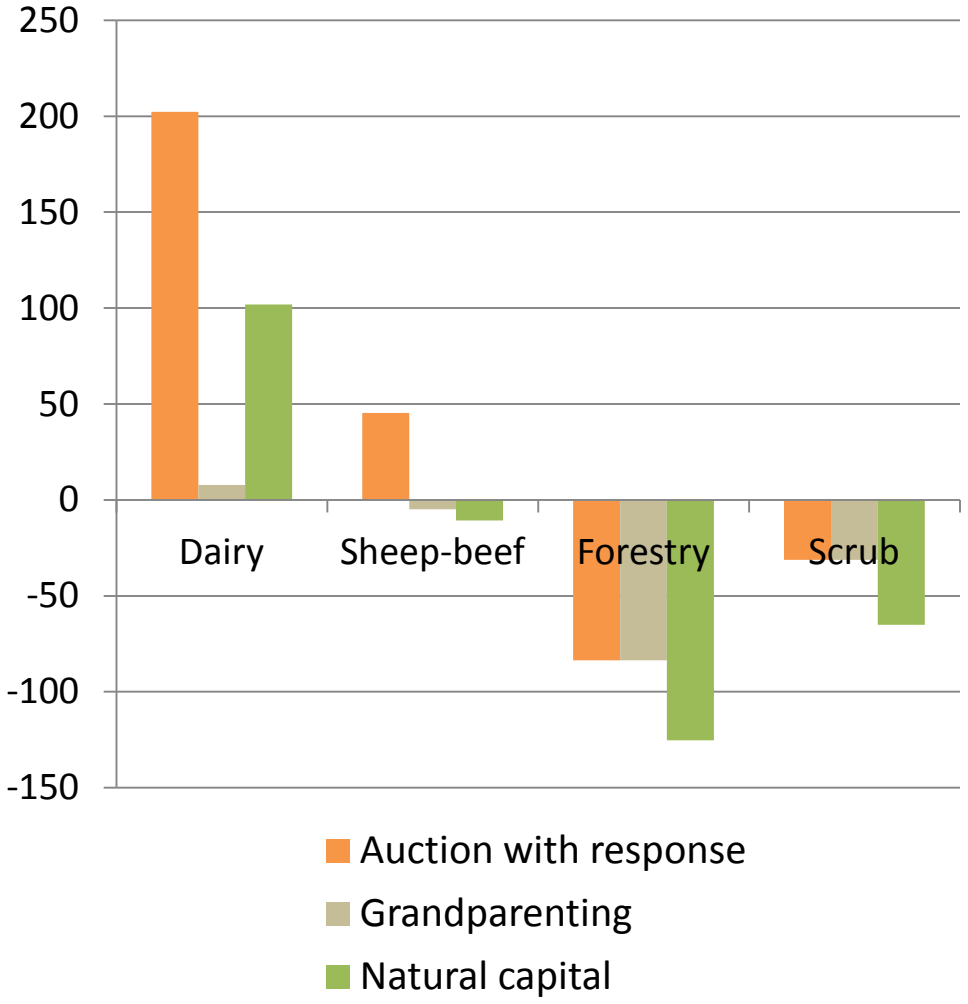
- Carbon price $25
- Simulations to 2020

The LURNZ model

- A simulation model of national land use
- Dynamic and spatial
- Four rural sectors
  - dairy farming
  - sheep and beef farming
  - plantation forestry
  - scrub
- Econometrically estimated using data on past land-use decisions and their drivers
- Emissions and sequestration at a fine spatial scale



Cost per hectare ($)



(+) Carbon liability

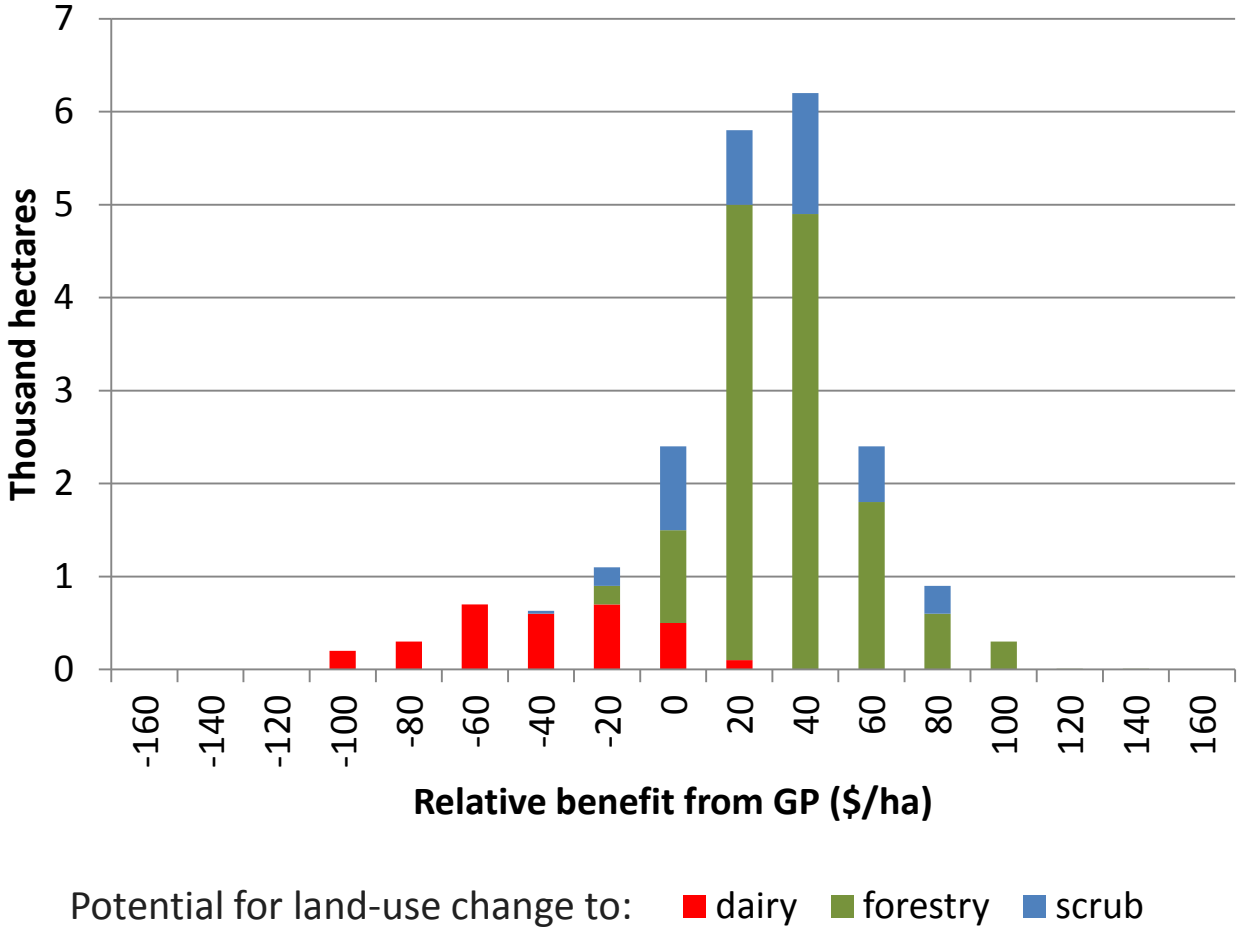
(-) Reward for sequestration

(-) Net benefit of mitigation

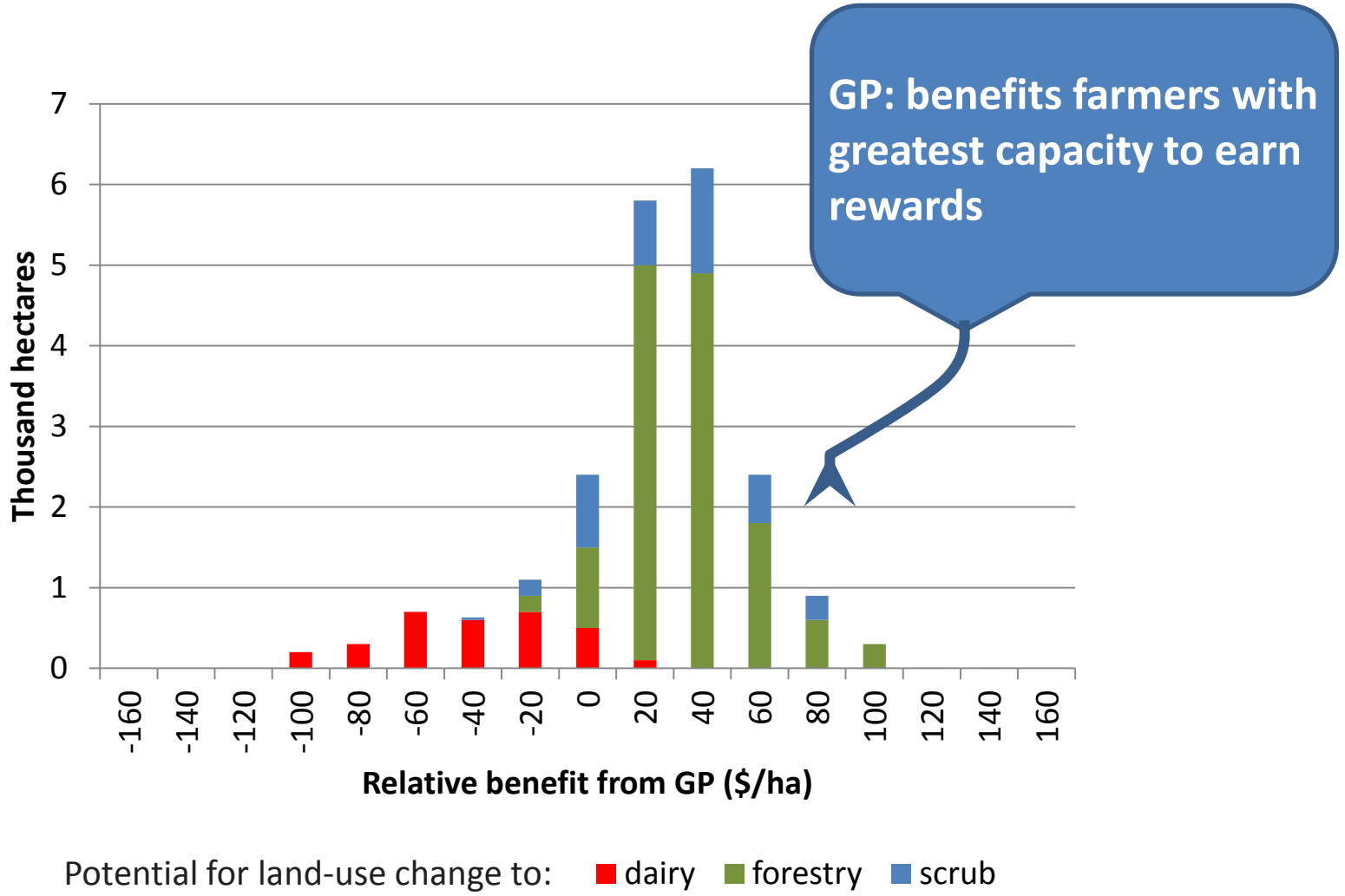
(-) Value of free allocation

(+) Cost of land use change

Grandparenting vs. natural capital allocation

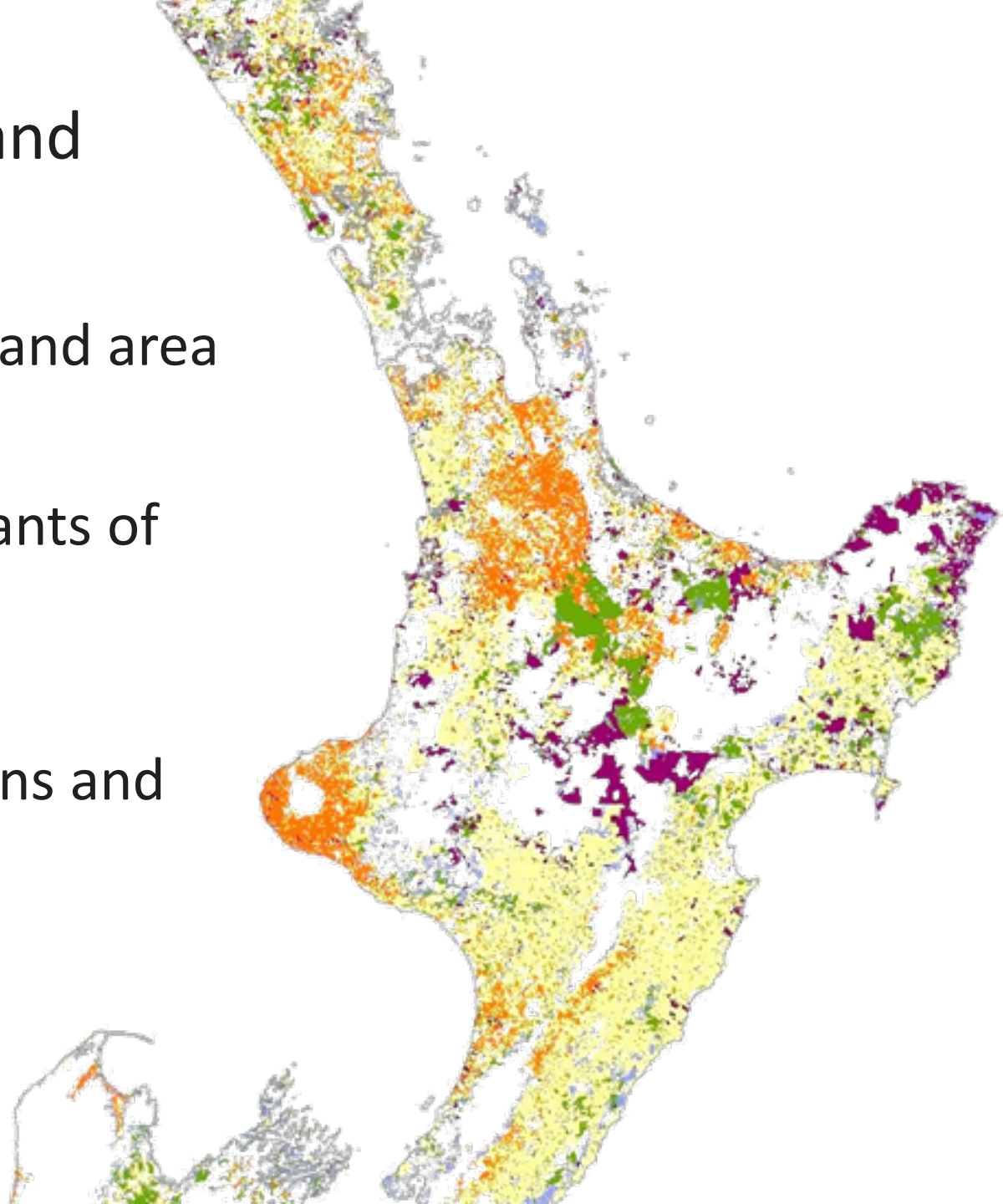


Grandparenting vs. natural capital allocation



Māori freehold land

- Six percent of NZ's land area
- Low-quality land
- Owned by descendants of original owners
- Multiple owners
- Subject to restrictions and protections



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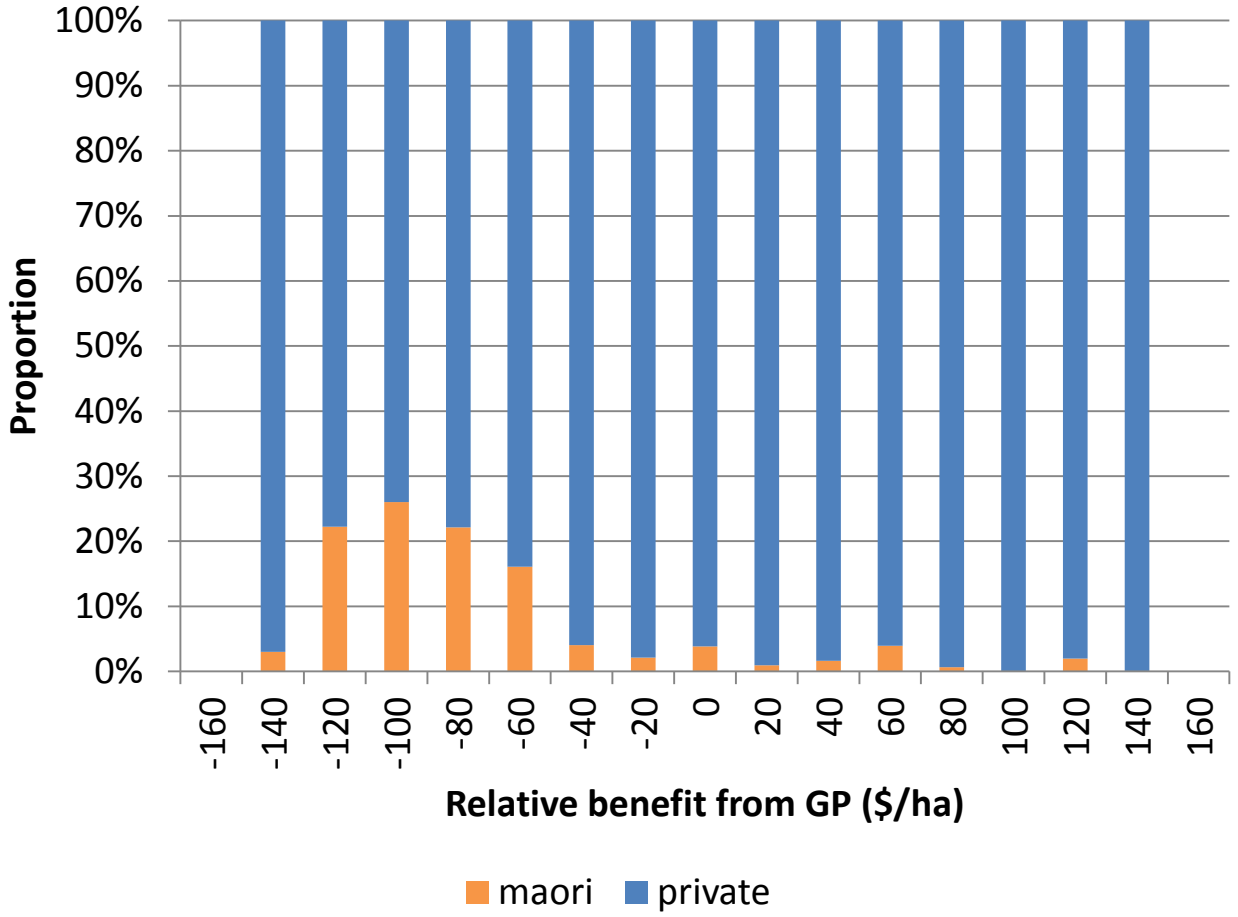

Conclusions

- Sector-level impacts may mask large amounts of within-sector heterogeneity
- Under grandparenting relative to the natural capital allocation approach
  - Owners of relatively overdeveloped land are better off
  - Owners of relatively underdeveloped land are worse off
  - Owners of Maori freehold land are worse off
- Grandparenting provides additional benefits to those who already have the greatest capacity to earn rewards for mitigation